Application

Underground Injection Control Permit

Prepared For Submittal To:

United States Environmental Protection Agency

Region III – Underground Injection Control Program

1650 Arch Street

Philadelphia, Pennsylvania 19103-2029

Project Location:

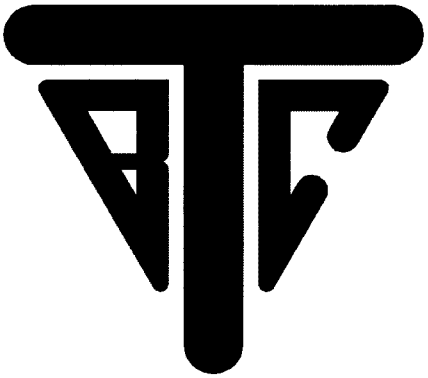
Texas Brine Company Saltville, LLC

Saltville High Pressure Brine Field

864 Ader Lane

Saltville, Virginia 24370-4309

Smyth / Washington County



Corporate Address:

Texas Brine Company Saltville, LLC

4800 San Felipe

Houston, Texas 77056-3908

Prepared On:

September 1, 2011

Prepared By:

United Brine Services Company, LLC

Mark J. Cartwright, President and Geologist

Jeff L. McCartney, Geologist and Manager of Wells

Joseph A. Vance, Civil Engineer

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OMB No. 2040-0042 Approval Expires 12/31/2011

United States Environmental Protection Agency

EPA

Underground Injection Control Permit Application

(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)

I. EPA ID Number

	T/A	C
U		

Read Attached Instructions Before Starting

For Official Use Only

Application approved mo day year	Date received mo day year	Permit Number	Well ID	FINDS Number

II. Owner Name and Address

Owner Name: Texas Brine Company Saltville, LLC

Street Address: 4800 San Felipe

Phone Number: (713) 877-2634

City: Houston

State: TX

ZIP CODE: 77056-3908

III. Operator Name and Address

Owner Name: Texas Brine Company Saltville, LLC

Street Address: 864 Ader Lane

Phone Number: (276) 496-3363

City: Saltville

State: VA

ZIP CODE: 24370-4309

IV. Commercial Facility

- [x] Yes
- [ ] No

V. Ownership

- [x] Private
- [ ] Federal
- [ ] Other

VI. Legal Contact

- [x] Owner
- [ ] Operator

VII. SIC Codes

1479

VIII. Well Status *(Mark "X")*

- [ ] A. Operating — Date Started mo day year:
- [ ] B. Modification/Conversion
- [x] C. Proposed

IX. Type of Permit Requested *(Mark "x" and specify if required)*

- [ ] A. Individual
- [x] B. Area

Number of Existing Wells	Number of Proposed Wells	Name(s) of field(s) or project(s)
	10	Saltville High Pressure Brine Field

X. Class and Type of Well *(see reverse)*

A. Class(es) (enter code(s))	B. Type(s) (enter code(s))	C. If class is "other" or type is code 'x,' explain	D. Number of wells per type (if area permit)
III	G		10

XI. Location of Well(s) or Approximate Center of Field or Project

Latitude Deg	Min	Sec	Longitude Deg	Min	Sec	Township and Range Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line
36	51	29	-81	46	17								

XII. Indian Lands *(Mark "X")*

- [ ] Yes
- [x] No

XIII. Attachments

(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)

For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A--U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.

XIV. Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibliity of fine and imprisonment. (Ref. 40 CFR 144.32)

A. Name and Title *(Type or Print)*	B. Phone No. *(Area Code and No.)*
Mark Cartwright, President of Texas Brine Company Saltville, LLC	(713) 877-2634
C. Signature	D. Date Signed
	9/1/11

EPA Form 7520-6 (Rev. 12-08)

SUMMARY OF APPLICATION DATED SEPTEMBER 1, 2011

Texas Brine Company Saltville, LLC (TBCS) owns and operates the **Saltville High Pressure Brine Field** located in the Town of Saltville in Washington County and Smyth County, Virginia. TBCS proposes to expand this brine operation. The purpose of this application is to obtain an Underground Injection Control (UIC) Area Permit for authorization to construct and operate **Class III G injection wells** through injection into the MacCrady and Little Valley Formations. The proposed maximum number of wells in operation at any time is ten (10). Over the life of the permit, the proposed total number of wells is forty-six (46).

Attachments A, B, C, D, F, H, I, J, K, L, M, N, O, P, Q, R, S, T, U are appended hereto.

ATTACHMENT A – AREA OF REVIEW METHODS

In accordance with established criteria for this geographic location and the adjacent UIC permit, the area of review is defined by a 1/4 mile fixed radius from the proposed well bores circumscribing the project area.

ATTACHMENT B – MAPS OF WELL/AREA AND AREA OF REVIEW

The area of review extends 1/4 mile from the proposed wellbores. The Topographic Map includes topographic mapping to 1 mile from the facility property boundary.

A significant number of shallow brine wells, approximately 186, where drilled from 1812 - 1933 for brine and salt production. These wells are located in the valley north, northeast, and northwest of the project area and are indicated on Figure 2 and Figure 4 as the Low Pressure Brine Field. See the following exhibits, appended hereto:

- **Figure 1 – Topographic Map**
- **Figure 2 – Area of Review Map**

See **Appendix A – Property Owner List** for properties located within 1/4 mile of the facility. The list is based on digital tax map records of the respective counties as of September 27, 2010.

54

CARDWELL TOWN WELL

HENRYTOWN

ROUTE 611

FORMER POND 5

FORMER POND 6

HOLSTON RIVER

NORTH FORK

FORMER CHLORINE PLANT SITE

ROUTE 91

#10 WELL

CEDAR BRANCH

2.1 MILES

1.6 MILES

1 MILE

SMYTH COUNTY

WASHINGTON COUNTY

LOW PRESSURE BRINE FIELD

SALTVILLE QUAD

BROADFORD QUAD

GLADE SPRING QUAD

CHILHOWIE QUAD

TOWN OF SALTVILLE

PLASTERCO

ROUTE 745

WITT SPRING

RICH

ROUTE 107

TOWN OF SALTVILLE

HARDSCRABBLE HOLLOW

QUARRY

ROUTE 610

QUARRY

MCHENRY CREEK

HANCKEL

KEYWOOD BRANCH

VALLEY

QUARRY CAVE NO. 1

1 MILE

ROUTE 748

ROUTE 91

SOUTH FORK

0 2000' 4000'

SCALE: 1" = 2000'

VASP NAD '83

:

OPOGRAPHIC DATA IS DERIVED FROM A DTM FROM AERIAL
ING PREPARED UNDER VIRGINIA BASE MAPPING PROGRAM IN

PREPARED FOR:

Texas Brine Company Saltville, LLC

Figure 1 – Topographic Map

PREPARED BY:

LBL & ASSOCIATES, PC
SURVEYORS • ENGINEERS
BOUNDARY - CONSTRUCTION - ENERGY - ENVIRONMENTAL - MINING
430 Virginia Avenue, Richlands, Virginia 24641
Phone: 276-596-9646 - Fax: 276-596-9736

PREPARED ON: 04-05-2011

LEGEND

- UIC AREA PERMIT
- WELLS UNDER PERMIT ID #VAS3G931BSMY
- AREA OF REVIEW
- TBCS BOUNDARY
- POLITICAL BOUNDARY
- INDEX CONTOUR (2100)
- INTERMEDIATE CONTOUR
- SURFACE WATER
- PAVED ROAD

ATTACHMENT C – CORRECTIVE ACTION PLAN AND WELL DATA

Corrective Action Plan

Within the area of review and the proposed injection zone, the permittee is not aware of any wells that are not properly plugged. If an inactive well is discovered within the area of review and the proposed injection zone that is not properly plugged, excluding Well #8, the following corrective action plan will be implemented:

1.) Immediately stop all fluid injection in the adjacent injection well(s) and allow the injections well(s) to stabilize.

2.) Notify the Director.

3.) Plug the inactive well in accordance with applicable federal regulations and obtain approval from the Director.

4.) Resume fluid injection.

Well Data

See **Table 1 – Area of Review Injection Zone Well Data**, appended hereto, for the data of wells within the area of review that penetrate the injection zone. This data is approximate and is based on the best available sources. There were four additional wells, Wells #1, #2, #3, and #4, that were lost when the cavern collapsed and the surrounding area subsided in 1960. These wells are approximately located on Figure 2. The collapse also caused Well #8 to lose integrity.

See **Figure 2 – Area of Review Map**, appended in Attachment B, for the approximate location of wells within the area of review.

Table 1 - Area of Review Injection Zone Well Data

Wells Owned by Texas Brine Company Saltville, LLC

Well ID	Status	Original Drill Date	Re-entry or Plugged Date	Northing (ft)	Easting (ft)	Elevation (ft)	Depth (ft)
TBCS 1A	Active	04/28/08	01/18/09	3488230	10527060	2160	3990
9	Active	06/01/46	07/16/10	3491360	10526480	2050	2518
13	Plugged	03/27/53	12/06/72	3492090	10526760	2080	2275
13A	Active	02/12/06	N/A	3492090	10526760	2080	1773
14	Plugged	08/18/54	11/29/72	3491960	10526690	2080	2218
14A	Active	01/01/06	N/A	3491960	10526690	2080	1779
15	Active	09/23/55	12/20/08	3492240	10526880	2100	2486
17	Active	03/25/58	05/14/10	3491330	10526780	2120	2468
131	Plugged	10/11/96	10/11/02	3488690	10527380	2150	9342

Wells Owned by Saltville Gas Storage Company, LLC

Well ID	Status	Original Drill Date	Re-entry or Plugged Date	Northing (ft)	Easting (ft)	Elevation (ft)	Depth (ft)
10	Plugged	10/05/51	11/27/72	3492120	10525540	1770	1711
11	Plugged	01/14/52	11/28/72	3491980	10524760	1850	2365
12	Plugged	05/03/52	11/23/72	3491950	10524570	1840	2969
16	Active	1959	-	3490090	10525810	2150	3972
18	Active	1959	-	3491870	10524270	1840	3010
19	Active	1960	-	3491680	10524040	1870	3073
20	Active	11/24/62	-	3490200	10525520	2190	3912
21	Active	02/03/61	-	3491590	10523860	1880	2984
22	Active	10/27/61	-	3491390	10523690	1890	3190
23	Active	1963	-	3491180	10523570	1910	3243
24	Plugged	11/17/63	12/03/72	3490760	10523950	2090	3565
25	Active	12/15/63	-	3491010	10524020	2060	3406
26	Active	1965	-	3491190	10524190	2060	3372
27	Active	1966	-	3491340	10524390	2050	3315
28	Active	1968	-	3491470	10524610	2060	3286
29	Plugged	-	12/09/72	-	-	-	≈ 3000

Wells Owned by Saltville Industrial Development Authority

Well ID	Status	Original Drill Date	Re-entry or Plugged Date	Northing (ft)	Easting (ft)	Elevation (ft)	Depth (ft)
5	Plugged	04/1939	12/09/72	3492290	10525740	1820	1639
6	Plugged	05/1939	12/09/72	3492420	10525900	1820	1902
7	Plugged	02/18/38	12/09/72	3492520	10526070	1820	1580
8	Inactive	03/22/43	N/A	3491400	10526190	2020	-

ATTACHMENT D – MAPS AND CROSS SECTION OF USDWS

According to *Ground Water Quality Monitoring in the Tennessee Valley Region*, written by Wiley F. Harris and published by Tennessee Valley Authority in October 1981, the project area lies within the Valley and Ridge Regional Aquifer. According to the report, the Valley and Ridge Cambrian-Ordovician carbonates are considered to be high yielding and to have good water quality.

According to the *Hydrologic Atlas*, published by the United States Geological Survey in 1997, "Water in the Valley and Ridge aquifers moves mostly along fractures and bedding planes in all rock types, and in solution openings in the carbonate rocks. The alternating sequences of upfolded and downwarped rocks in the Valley and Ridge Province, coupled with the stream network that has developed in the folded rocks, create a series of shallow, isolated, local ground-water flow systems. Most of the ground water under the ridges flows across the strike of the rocks, but in the valleys, it usually moves along the strike. The flow within these local ground-water systems is predominately within a few hundred feet of the land surface. The regolith that covers the consolidated rocks in most places has some primary porosity. The local flow systems receive recharge mostly to the regolith on the tops or flanks of ridges. The water then moves into the underlying bedrock or flows within the regolith downgradient toward the intervening valleys and discharges to streams or springs."

Freshwater wells located near the town of Saltville are mostly drilled into the Honaker, Nolichucky, and Copper Ridge dolomites with depths ranging from 70 feet to 1050 feet. The Town of Saltville currently gets its water from two different wells, the Cardwell Town Well located in the Poor Valley area and the No. 10 Well located in the Broady Bottom area. Note that these wells are not within the area of review. The Cardwell Town Well is approximately 450 feet deep, draws groundwater from the Tonoloway Limestone aquifer, and is approximately 2.1 miles north of the project area. The No. 10 Well is approximately 1,050 feet deep, draws groundwater from the Honaker Dolomite Formation aquifer, and is approximately 1.6 miles northeast of the project area.

According to the Smyth County Comprehensive Plan 2010 Update, these two wells offer the Town an estimated safe yield of 1,200,000 gallons per day with an estimated current use of 650,000 gallons per day.

A shallow hand-dug well is located within the area of review but no records are known to exist. Also, an inactive freshwater well is located near the plant office. There are two other wells located within the area of review that are used for industrial purposes.

Witt Spring, also locally known as Smokey Row Spring, near Plasterco is identified within the area of review. According to the Smyth County Comprehensive Plan 2010 Update, the Virginia Department of Health issued a Notice of Surface Water Influence Determination and a Boil Water Notice to the Witt Spring service area in November 2001. The Town of Saltville occasionally used the spring as a back-up water supply up to that time. Three additional springs are identified within the area of review. The Town of Saltville provides public drinking water to its residents, and, therefore, no freshwater wells/springs within the area of review are known to be used for drinking water.

See **Table 2 – Area of Review Freshwater Well Data**, appended hereto, for data of freshwater wells within the area of review. See **Figure 2 – Area of Review Map**, appended in Attachment B, for the approximate location of wells/springs within the area of review.

Table 2 - Area of Review Freshwater Well Data

Wells Owned by Texas Brine Company Saltville, LLC

Well ID	Drill Date	Depth (ft)	Formation	Description
FW Well #1	2005	≈1100	Honaker	Used for makeup water.
FW Well #2	03/02/01	425	Honaker	Originally used for agricultural purposes. Not currently used.

Wells Owned by Saltville Gas Storage Company, LLC

Well ID	Drill Date	Depth (ft)	Formation	Description
FW Well #3	2009	≈ 950	Honaker	Used for emergency fire suppression and makeup water.

Wells / Springs Owned by Others

Well / Spring ID	Formation	Description
Witt Spring	Copper Ridge	Used by Town as backup until 2001. Not currently used for DW.
Palmer Mill Spring	Honaker	Not currently used for DW.
Spring #1	Honaker	Not currently used for DW.
Spring #2	-	Not currently used for DW.

ATTACHMENT F – MAPS AND CROSS SECTIONS OF GEOLOGIC STRUCTURE OF AREA

The project area lies within the Appalachian Basin and furthermore within the Valley and Ridge Physiographic Province of Virginia. The geology of the area consists of sedimentary rocks including limestone, dolomite, and shale. The Physiographic Map of Virginia Counties, published by the College of William and Mary under Chad Roberts and Christopher M. Bailey in 2000, further identifies the project area as within the Great Valley subprovince near its northern boundary with the Ridge and Valley subprovince. The Great Valley subprovince is defined as "broad valley[s] with low to moderate slopes underlain by carbonate rocks."

The Saltville area is unique in that this is the only known deposit of native rock salt to exist in the Southern Appalachian Basin. The salt deposits occur in the MacCrady Formation and lesser amounts are found in the adjacent overlying Little Valley Formation. The salt-bearing formations and other enclosing sedimentary strata have been drastically bent into a northeast trending structure known as the overturned Greendale Syncline. The paralleling Saltville Thrust Fault was also developed with this folding. That caused Ordovician and Cambrian dolomites, shales, and limestones to be pushed northwestward over salt-bearing formations.

According to the *Hydrologic Atlas*, "The Valley and Ridge Province is characterized by layered sedimentary rock that has been complexly folded and locally thrust faulted. As the result of repeated cycles of uplift and erosion, resistant layers of well-cemented sandstone and conglomerate form elongate mountain ridges and less resistant, easily eroded layers of limestone, dolomite, and shale form valleys." The project area is correctly characterized by the previous description. The project area lies within Segment 11 of the Hydrologic Atlas, which consists of the States of Delaware, Maryland, New Jersey, North Carolina, West Virginia, and the Commonwealths of Pennsylvania and Virginia. The Valley and Ridge Province, like the other provinces in Segment 11, generally trend southwest to northeast.

Byron N. Cooper, in his article "Geology of the Salt and Gypsum Deposits in the Saltville Area Smyth and Washington Counties, Virginia" further describes the complex geology at Saltville as follows. "The salt, at least in the overturned limb of the Greendale syncline, occurs largely, if not wholly, as tectonic breccia that was apparently generated in localized quasi-stratigraphic zones so as to incorporate as cataclasts pieces derived from intercalated anhydrite, dolomite, gypsum, and shale. Some of these evaporitic beds appear to be primary, but there is also considerable salt and gypsum-anhydrite occurring as matrix minerals in autoclastic breccias and in veins. The structure of the salt and gypsum beds is very complicated as a result of the overriding of the southeast recumbent limb by Cambrian rocks forming the sole of the Saltville Thrust. A double thickness of the Maccrady produced by strong overturning of the upper limb of the Greendale syncline occurs in the Saltville area." The Saltville Thrust Fault can be seen on the surface along the northwestern facing slope within the project area. This fault is sketched in **Figure 2, Figure 4, and Figure 5**.

The geological data on the injection zone and the confining zones including geological name, thickness, and depth are in Figure 4. See **Appendix B – Geologic Data** for lithologic descriptions available from the borings from Well 131.

The lateral limits of the US Gypsum mines, shown approximately on **Figure 2**, were derived from the Route 91 re-route plans.

See the following exhibits appended hereto:

- **Figure 3 – Physiographic Map by Roberts & Bailey**
- **Figure 4 – Geologic Plan View**
- **Figure 5 – Geologic Cross Section A-A'**

Physiographic Map of Virginia Counties

2000

C. Roberts & C.M. Bailey, College of William & Mary

Modified from Virginia Division of Mineral Resources/
U.S. Geological Survey Map of Mineral Producing Localities
http://minerals.usgs.gov/minerals/pubs/state/985199mp.pdf

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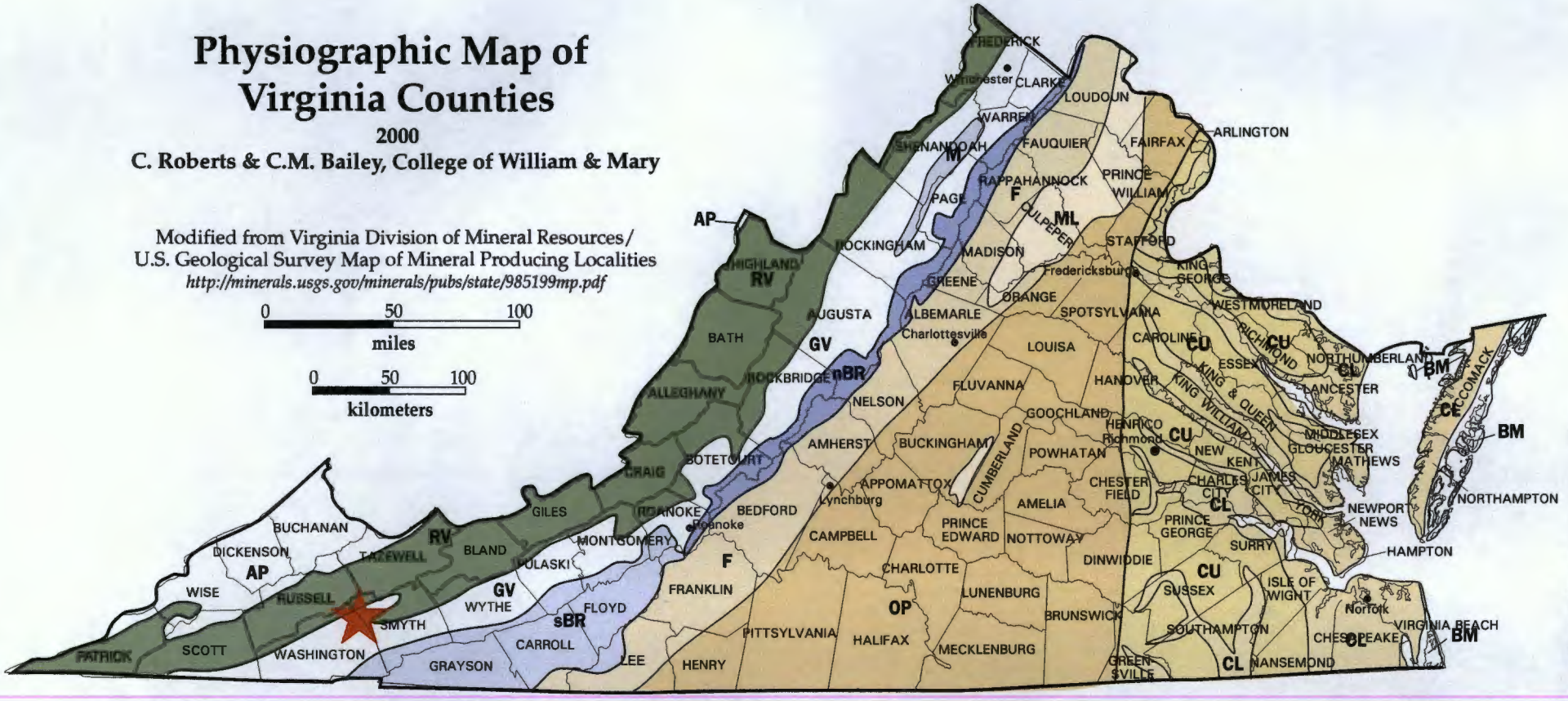
miles

0 50 100
kilometers



Appalachian Plateau province

AP- Rugged, well-dissected landscape with dendritic drainage pattern. Elevation- 1000'-3000' with High Knob rising to over 4000'.

Valley & Ridge province

RV- Ridge & Valley subprovince: long linear ridges separated by linear valleys with trellis drainage pattern. Elevation- 1000'-4500'.

GV- Great Valley subprovince: broad valley with low to moderate slopes underlain by carbonate rocks. Elevation- 500'-1500' north of Roanoke, 1200'-2300' south of Roanoke

M- Massanutten Mountain: Series of long linear ridges that rise to 3000' above the Great Valley

Blue Ridge province

nBR- northern Blue Ridge subprovince: rugged region with steep slopes narrow ridges, broad mountains, and high relief. Elevation 1500'-4200'.

sBR- southern Blue Ridge subprovince: broad upland plateau with moderate slopes. Elevation 2400'- 3000' with higher peaks rising above upland, including 5729' Mt. Rogers.

Piedmont province

F- Foothills subprovince: region with broad rolling hills and moderate slopes. Elevation 400'-1000' with peaks rising to 1500'-2500'.

ML- Mesozoic lowlands subprovince: region with modest relief and low slopes underlain by Mesozoic sedimentary and igneous rocks. Elevation 200'-400'.

OP- Outer Piedmont subprovince: broad upland with low to moderate slopes. Elevation 600'-1000' in west gradually diminishing to 250'- 300' in east.

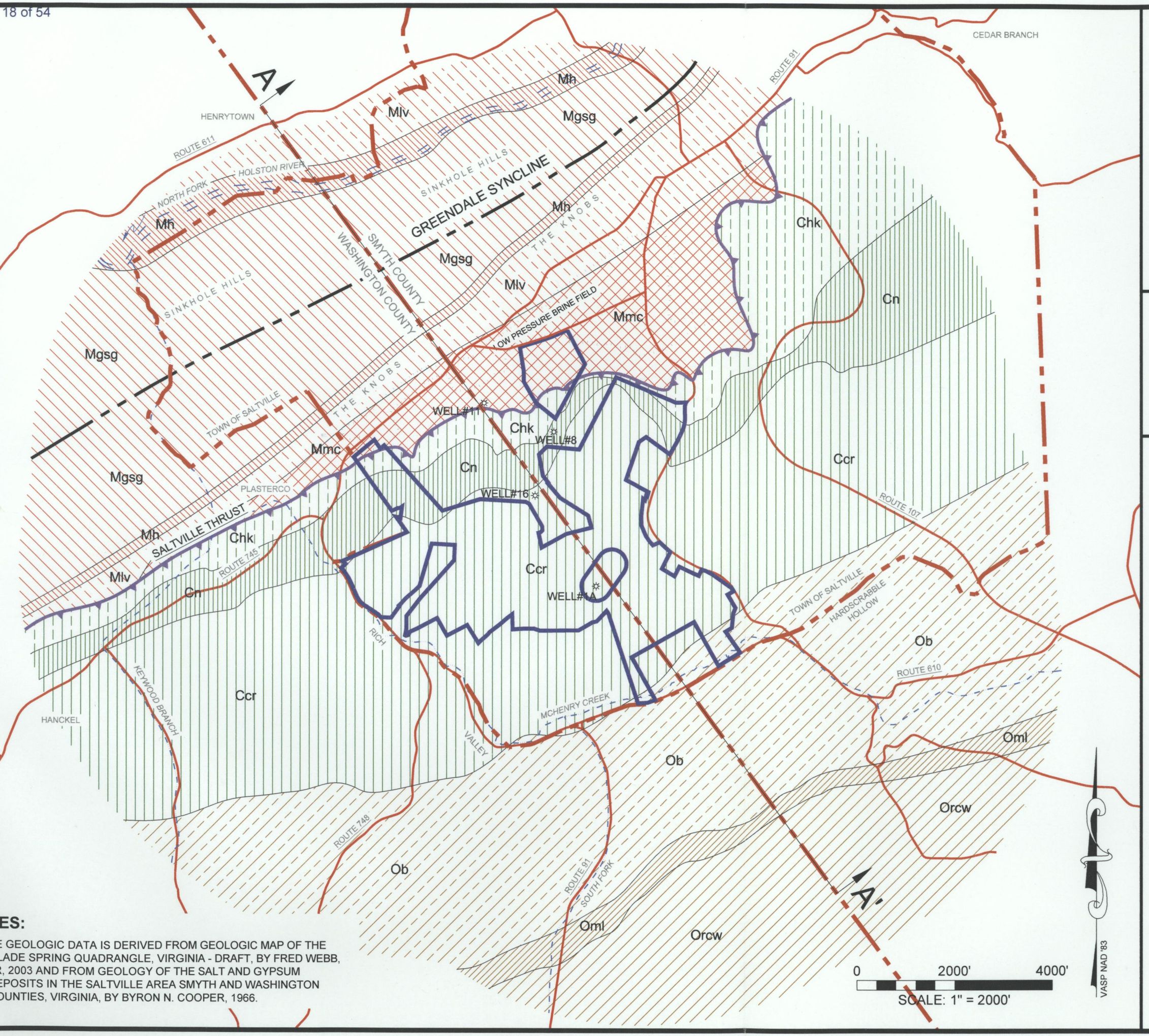
Coastal Plain province

CU- Upland subprovince: broad upland with low slopes and gentle drainage divides. Steep slopes develop where dissected by stream erosion. Elevation- 60'-250'.

CL- Lowland subprovince: flat, low-relief region along major rivers and near the Chesapeake Bay. Elevation- 0-60'.

BM- Barrier Islands & Salt Marshes: low, open areas covered with sediment and vegetation in direct proximity to the Chesapeake Bay and Atlantic Ocean. Elevation 0'-15'.

Figure 3 - Physiographic Map



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E GEOLOGIC DATA IS DERIVED FROM GEOLOGIC MAP OF THE LADE SPRING QUADRANGLE, VIRGINIA - DRAFT, BY FRED WEBB, R, 2003 AND FROM GEOLOGY OF THE SALT AND GYPSUM EPOSITS IN THE SALTVILLE AREA SMYTH AND WASHINGTON OUNTIES, VIRGINIA, BY BYRON N. COOPER, 1966.

PREPARED FOR:

Texas Brine Company Saltville, LLC

Figure 4 – Geologic Plan View

PREPARED BY:

LBL & ASSOCIATES, PC
SURVEYORS - ENGINEERS
BOUNDARY - CONSTRUCTION - ENERGY - ENVIRONMENTAL - MINING
430 Virginia Avenue, Richlands, Virginia 24641
Phone: 276-596-9646 - Fax: 276-596-9736

PREPARED ON: 02-22-2011

LEGEND

UIC AREA PERMIT

POLITICAL BOUNDARY

SURFACE WATER

PAVED ROAD

ORDOVICIAN

Orcm – BOWEN, WITTEN, CHATTAM HILL, AND RICH VALLEY FORMATIONS

Oml – MIDDLE ORDOVICIAN LIMESTONE

Ob – BEEKMANTOWN FORMATION

CAMBRIAN

Ccr – COPPER RIDGE DOLOMITE

Cn – NOLICHUCKY FORMATION

Chk – HONAKER FORMATION

MISSISSIPPIAN

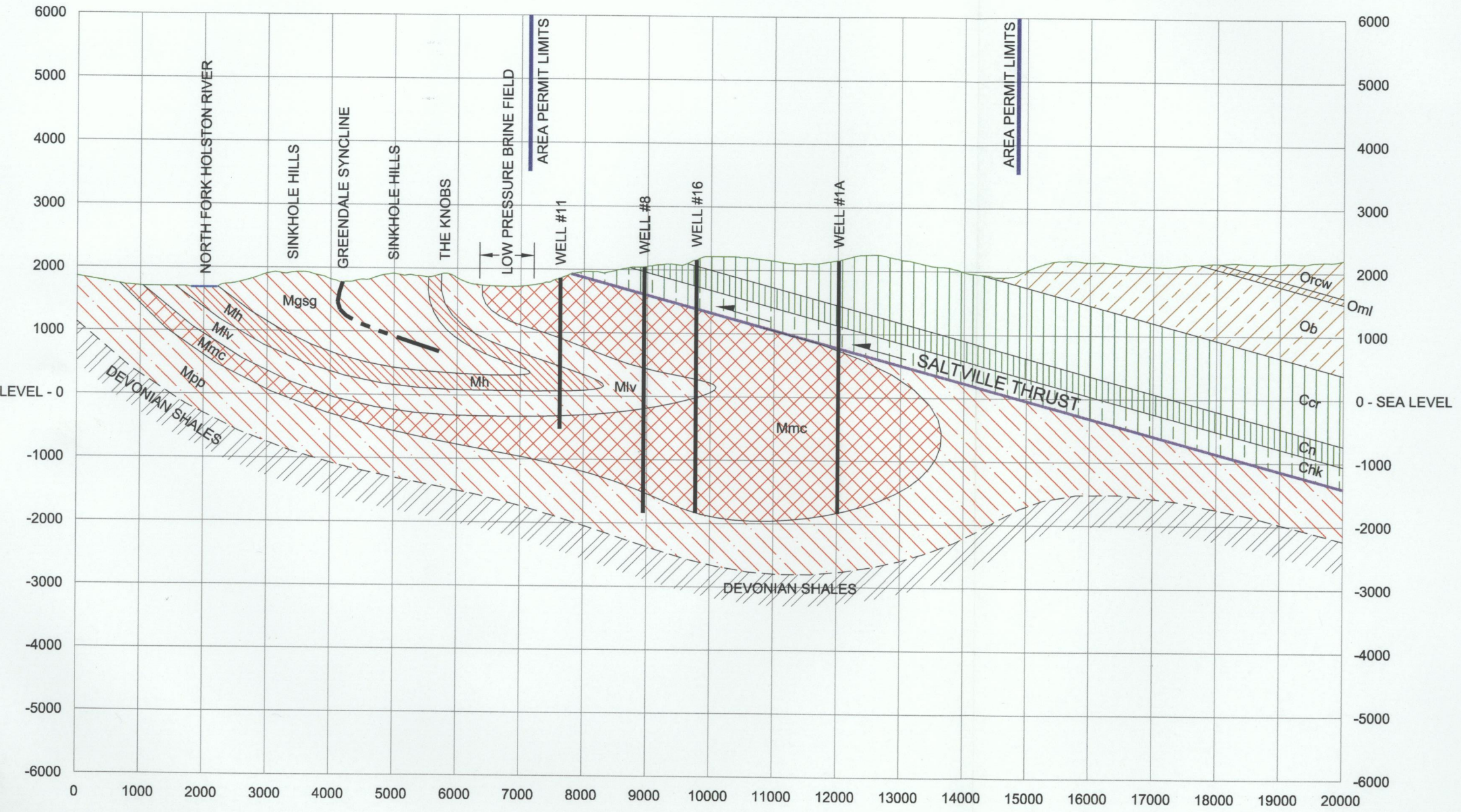
Mgsg – GASPER - SAINTE GENEVIEVE LIMESTONE

Mh – HILLSDALE LIMESTONE

Mlv – LITTLE VALLEY FORMATION

Mmc – MACCRADY FORMATION

Mpp – PRICE - PARROT FORMATIONS



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PREPARED FOR:

Texas Brine Company Saltville, LLC

Figure 5 – Geologic Cross Section A-A'

PREPARED BY:

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430 Virginia Avenue, Richlands, Virginia 24641
Phone: 276-596-9646 - Fax: 276-596-9736

PREPARED ON: 03-04-2011

LEGEND

EXISTING GROUND

ORDOVICIAN

Orcm – BOWEN, WITTEN, CHATTAM HILL, AND RICH VALLEY FORMATIONS

Oml – MIDDLE ORDOVICIAN LIMESTONE

Ob – BEEKMANTOWN FORMATION

CAMBRIAN

Ccr – COPPER RIDGE DOLOMITE

Cn – NOLICHUCKY FORMATION

Chk – HONAKER FORMATION

MISSISSIPPIAN

Mgsg – GASPER - SAINTE GENEVIEVE LIMESTONE

Mh – HILLSDALE LIMESTONE

Mlv – LITTLE VALLEY FORMATION

Mmc – MACCRADY FORMATION

Mpp – PRICE - PARROT FORMATIONS

ATTACHMENT H – OPERATING DATA

Olin Mathieson Chemical Corporation operated high pressure brine wells in the Saltville area from the 1890's through the early 1970's when the wells were plugged and abandoned. The proposed area permit is adjacent to Olin's operations. In the early 2000's, Virginia Gas Company re-entered many of the plugged wells a gas storage facility by mining salt. Upon re-entering the wells, the pressure at the wellheads varied but was found to be from 800 pounds per square inch to 1000 pounds per square inch. Since the wells had been plugged for about 30 years, these pressures were expected to have reached equilibrium and thereby be below the fracture pressure. TBCS proposes not to exceed this 1000 pounds per square inch shut-in pressure. The average injection pressure is expected to be 600 pounds per square inch.

Based on the proposed casing program and pump capacity, the average daily injection volume is expected to be 350 gallons per minute or 12,000 barrels per gallery per day. The proposed maximum daily volume is 16,000 barrels per gallery per day.

The proposed wells under this application will be connected to the existing network of pipelines, pumps, and ponds. The sample analyses of the fluids of Ponds A, B, and C, the brine processing ponds, are attached in **Appendix C – Ponds A, B, and C Sample Analysis Data** as a description of the approximate quantities and ranges in concentrations of the injected fluid. Injection fluid will be limited to fluid from existing brine holding ponds, distillate and purge from the evaporator plant, or fresh water obtained from shallow ground water wells on the facility or adjacent grounds.

ATTACHMENT I – FORMATION TESTING PROGRAM

As described in **ATTACHMENT H**, TBCS proposes not to exceed 1000 pounds per square inch shut-in pressure.

ATTACHMENT J – STIMULATION PROGRAM

No stimulation is expected to be necessary, and therefore no stimulation program is proposed.

ATTACHMENT K – INJECTION PROCEDURES

The proposed wells under this application will be connected to the existing network of pipelines, pumps, and ponds. The facility currently has two saturated brine holding ponds, Pond A and Pond C, and one unsaturated injection fluid holding pond, Pond B. TBCS has approved plans for an additional holding pond, Pond D, if and when is it needed. The facility currently has a system of pumps and a network of pipelines to transport the injection and return fluids. United Salt Corporation operates the evaporator onsite where salt is evaporated from the brine before returning to Pond B. See **ATTACHMENT U** for a description of United Salt Corporation.

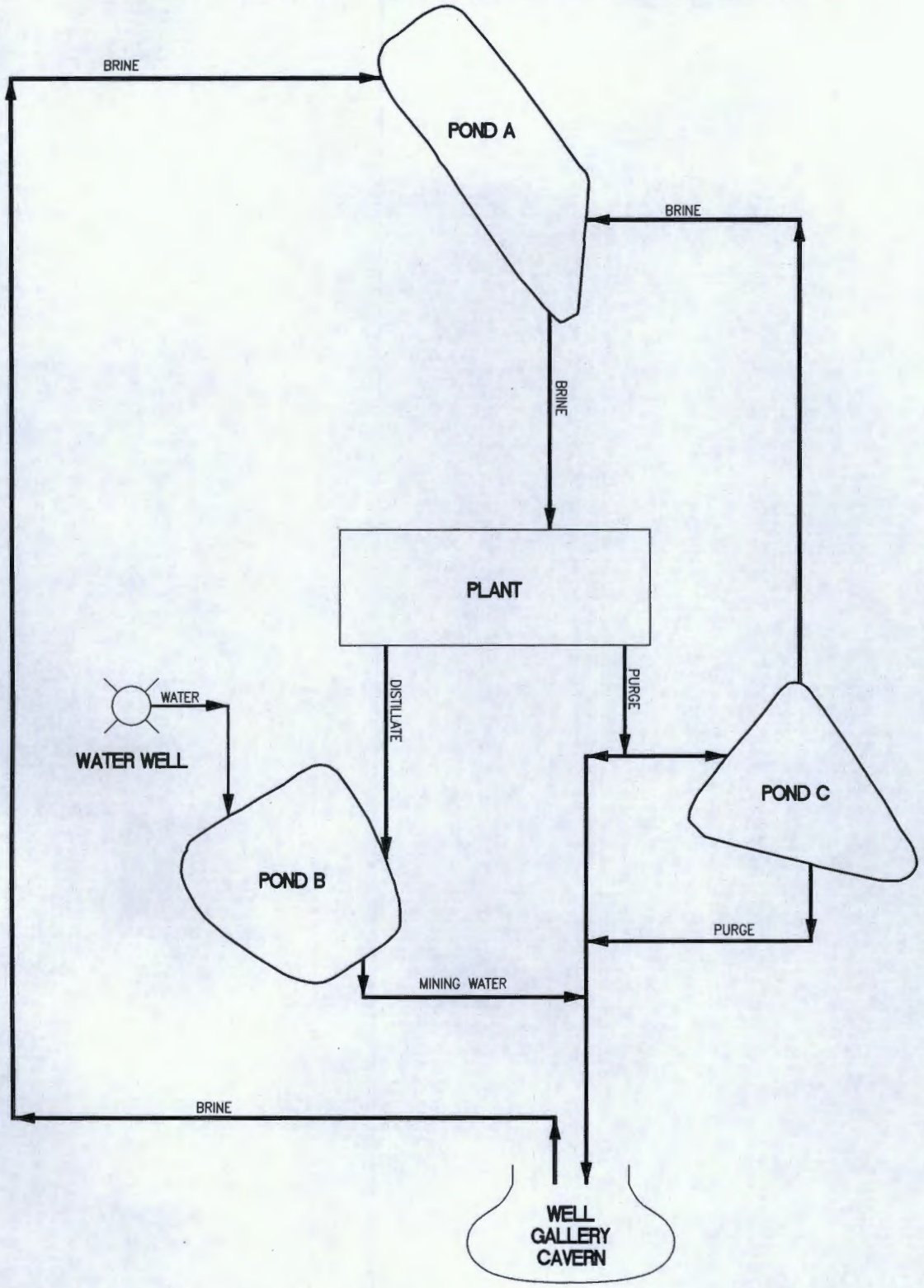
Modifications to the current system are proposed as it is expanded to meet the needs of the enlarged well field. The general characteristics of this typical system are described as follows. See **Figure 6 – Typical Recirculation Diagram**, appended hereto, for a description of the typical injection fluid flow illustration.

The following description is for two or three well galleries. Injection fluid is pumped from Pond B through injection pipelines to the wellhead and down the production casing, typically 4-1/2 inch, into the injection formations. The unsaturated injection fluid becomes saturated as it moves horizontally along the gallery walls from the injection well to the return well. The continued pressure from the injection pump forces the saturated brine up the production casing through the wellhead and into the return pipeline. The saturated brine is then pumped to Pond A or directly to the evaporator. Saturated brine is pumped from Pond A to the evaporator, if necessary. The evaporator pumps the unsaturated fluid again to Pond B. To promote evenly distributed mining and cavern development, the injection and return wells may be alternated periodically.

Wells may also be operated individually. For individual operation, fluid is injected through the production casing, typically 4-1/2 inch, to the cavern and returned through the annulus of the secondary production casing, typically 7 inch.

A hydrocarbon pad is typically installed outside the secondary production casing to control the amount of roof growth in the cavern. As mining progresses, portions of the pad may be withdrawn to allow new sections of the formation to be exposed.

Figure 6 - Typical Recirculation Diagram



NO.	REVISION	DATE	APPR.
A	PRELIMINARY	08/31/11	–

ATTACHED IMAGES:

UNITEDBRINE SERVICES COMPANY

SCALE: NONE
DATE: 08/31/11
APPROVED: TEXAS BRINE CO., LLC
DRAWN BY: AB. Trevino
REVISED BY:

TBC – SALTVILLE
WELL DIAGRAM

TYPICAL RECIRCULATION DIAGRAM

TBC – SALTVILLE

FILENAME – DATE – TIME: TYPICAL RECIRC DIAGRAM.DWG – 08/31/11–15:0
DWG. NO.: –

ATTACHMENT L – CONSTRUCTION PROCEDURES

The following procedures will be implemented during well construction. All hole sizes, casing sizes, and casing set depths are typical, and are subject to change based on field conditions.

1.) Construct pad location. Move in and setup drill rig and associated equipment.

2.) Drill conductor casing hole. Install conductor casing at least 50 feet below ground surface and cement back to the surface.

3.) Drill surface casing hole. Install surface casing at least 100 feet below ground surface and cement back to surface.

4.) Drill pilot hole and run open-hole wireline logs.

5.) Drill out pilot hole. Install production casing at least 200 feet below top of the MacCrady and cement back to surface.

6.) Conduct cement bond log, and initial casing inspection log.

7.) Conduct a hydrostatic pressure test on final cemented casing seat. Refer to Attachment P for details.

8.) Drill pilot hole and run lithology log. Hang suspended blanket casing and leaching casing string per lithology log.

ATTACHMENT M – CONSTRUCTION DETAILS

See the following exhibits, appended hereto, for a description of the typical surface and subsurface well details:

- **Figure 7 – Typical Wellhead Detail**
- **Figure 8 – Typical Wellbore Detail**

Figure 7 - Typical Wellhead Detail

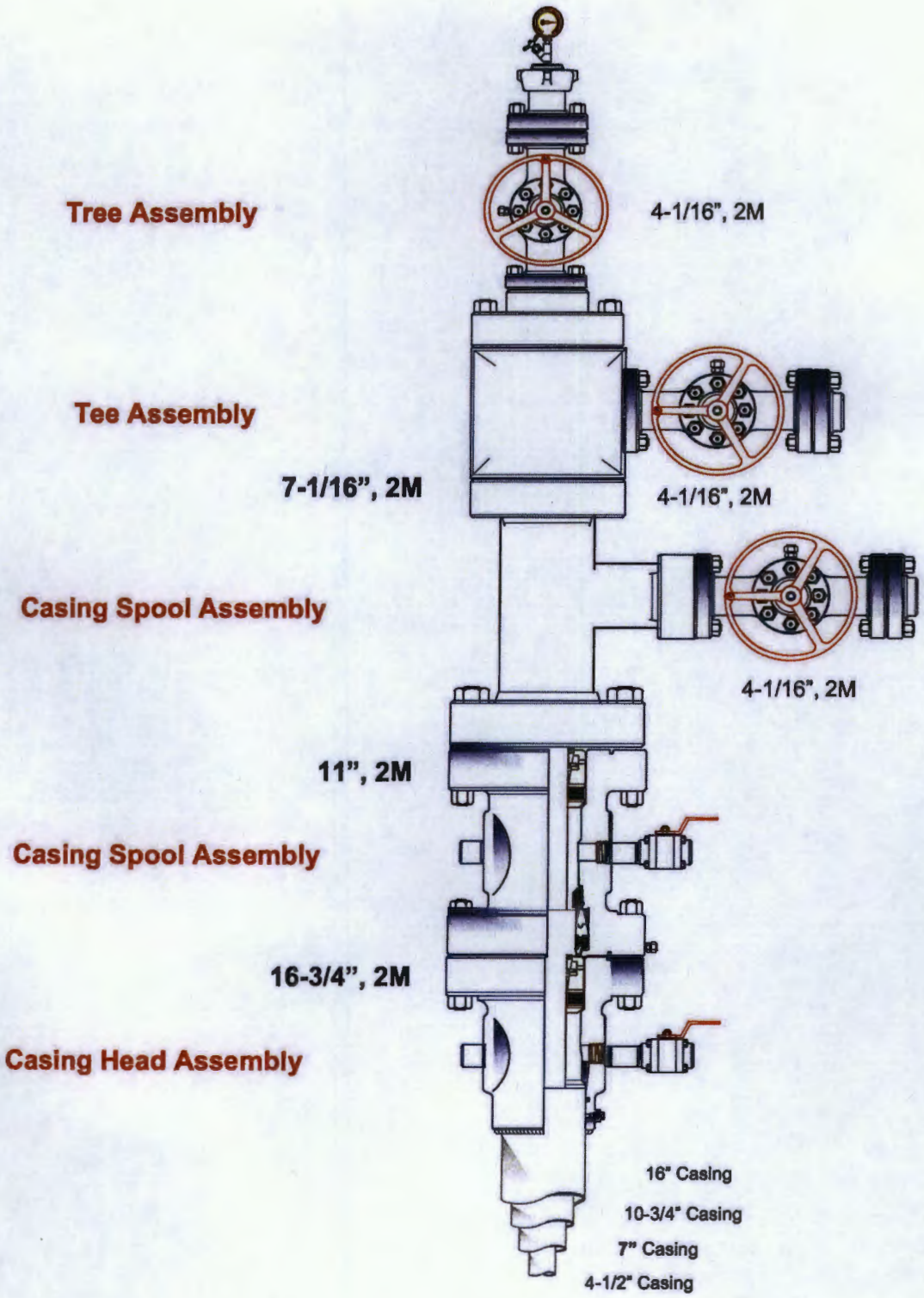
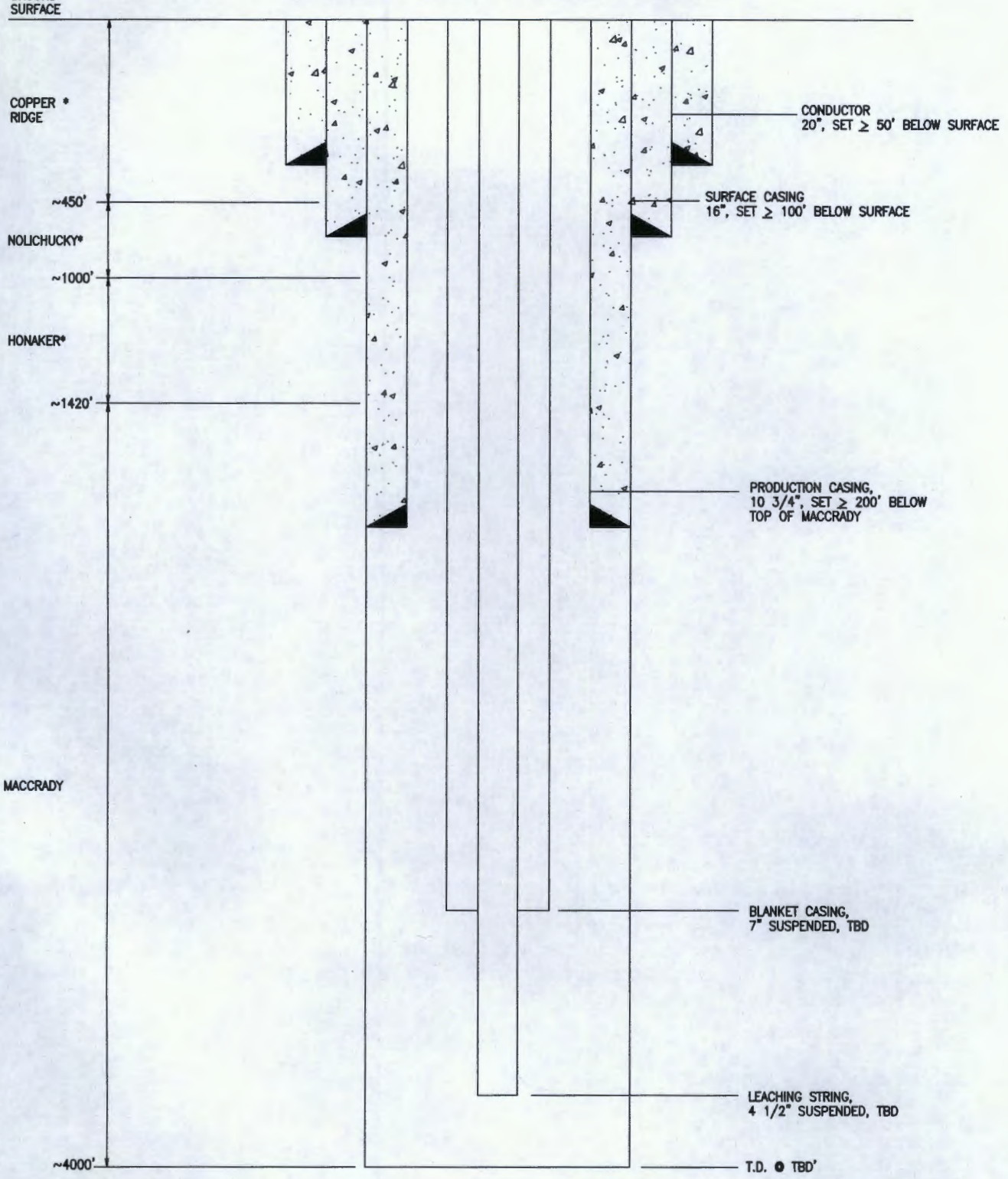


Figure 8 - Typical Wellbore Detail



NOTES:
1. DEPTHS SHOWN ARE TYPICAL FOR WELLS SOUTHEAST OF SALTVILLE FAULT.
2. ALL DEPTHS AND SIZES ARE APPROXIMATE AND MAY BE REVISED PER FIELD CONDITIONS.
3. CEMENT ALL SET CASING TO SURFACE.
4. HOLE SIZES ≥ CASING DIAMETER +4".

* IF PRESENT

NO.	REVISION	DATE	APPR.
A	ISSUED FOR REVIEW	06/29/11	–
B	CHANGES	08/31/11	MC

ATTACHED IMAGES:

UNITEDBRINE SERVICES COMPANY

SCALE: NONE | APPROVED: TEXAS BRINE CO. | DRAWN BY: AD, Trevino

DATE: 04/04/11 | REVISED BY:

TBC–SALTVILLE
WELL SCHEMATIC

PROPOSED BRINE PRODUCTION WELL

TBC–SALTVILLE

FILENAME – DATE – TIME: PROPOSED BRINE PRODUCTION WELL.DWG – 04/04/11–15:0

DWG. NO. –

ATTACHMENT N – CHANGES IN INJECTED FLUID

Slight pressure changes are expected as the unsaturated fluid becomes saturated through the dissolution of the salt. The following pressures will be remotely monitored and recorded. The results will be stored onsite and provided upon request.

- Injection pressure
- Return pressure
- Annulus pressure of the production casing string(s)
- Annulus pressure of the hydrocarbon pad

See **ATTACHMENT K** regarding intentional changes in the direction of fluid movement.

No significant volume of native fluid is expected to be found in the formation.

ATTACHMENT O – PLANS FOR WELL FAILURES

The injection system will be equipped with the following automatic switches to protect against well failure:

- High injection pressure switch at the pump
- Low suction pressure switch at the pump
- High vibration and temperature switch at the pump

If an automatic shutdown should occur, an investigation will begin to determine the source of the pressure change. If a problem or leak is discovered in the wellhead or wellbore equipment, it will be repaired as soon as practicably possible. TBCS will take all prudent steps to restore well integrity. If the problem cannot be readily corrected or immediate danger of migration exists, the pressure in the well will be reduced and stabilized. If the well cannot be stabilized and / or if the problem encountered cannot be corrected to the satisfaction of the Director, the well will be plugged and abandoned.

ATTACHMENT P – MONITORING PROGRAM

Pressure Monitoring

The pressure monitoring and recording described in **ATTACHMENT O** is a part of the monitoring program.

Mechanical Integrity Tests

TBCS will conduct a hydrostatic pressure test after the final casing seat is cemented and will submit the results to the Director for approval. Thereafter, TBCS will conduct an MIT once every five years thereafter for active wells. The results will be stored onsite and provided upon request.

Subsidence Monitoring Surveys

TBCS will conduct periodic subsidence monitoring surveys of the areas around the wells / galleries. These surveys will be performed at a frequency not less than twice per year and the results will be stored onsite and provided upon request. TBCS will perform these surveys in the early spring and late fall, typically April and November. See **Figure 9 – Typical Subsidence Monitoring Detail**, appended hereto, for a typical geographical representation of the proposed subsidence monitoring grids and a detail of the proposed monitoring points.

Should the results of any subsidence monitoring survey illustrate that any one point within a grid has moved more than 1 foot horizontally or vertically, TBCS will notify the appropriate state and federal agencies and consult an engineer. The event shall be evaluated and a report prepared by the engineer.

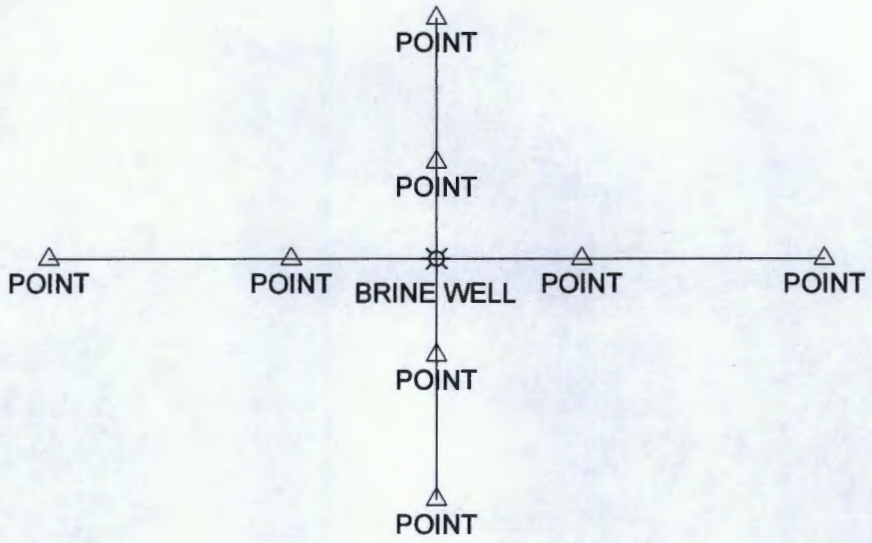
Should the results of any subsidence monitoring survey illustrate that any one point within a grid has moved more than 2 feet horizontally or vertically within 500 feet of any permanent structure or residence, TBCS shall immediately notify the appropriate state and federal agencies, post an evacuation alert with the media, and personally notify the immediate community.

Sonar Surveys

TBCS will conduct a sonar survey once every five years for active wells to depict the location and size of the caverns. The results will be stored onsite and provided upon request.

Subsidence Monitoring Layout

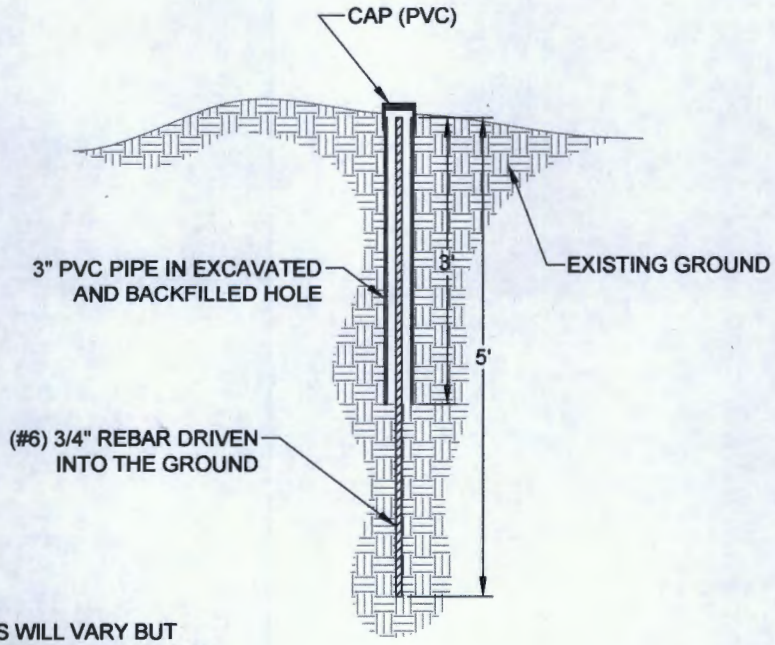
NOT TO SCALE



DISTANCE BETWEEN POINTS WILL VARY BUT GENERALLY 50' TO 100' FROM THE WELL TO THE FIRST AND 150' TO 200' THEREAFTER.

Subsidence Monitoring Point

SCALE: 1/2" = 1'



DISTANCE BETWEEN POINTS WILL VARY BUT GENERALLY 50' TO 100' FROM THE WELL TO THE FIRST AND 150' TO 200' THEREAFTER.

FIGURE 9
TYPICAL SUBSIDENCE MONITORING DETAIL
PREPARED BY: JAV
REVIEWED BY: UBSC,TBCS
PREPARED: 05-11-2011
TEXAS BRINE COMPANY SALTVILLE, LLC

PREPARED FOR:

ATTACHMENT Q – PLUGGING AND ABANDONMENT PLAN

See the following form and exhibit, appended hereto, for a description of the plugging and abandonment details:

- **EPA Form 7520-14 – Plugging and Abandonment Plan**
- **Figure 10 – Typical Plugging Detail**

Plugging and abandonment will be implemented as follows. All hole sizes, casing sizes, casing depths, and volumes are typical, and are subject to change based on field conditions. Wells may be converted to gas storage wells upon mining completion.

1.) Remove brine production equipment and convert to gas storage well.

Or

1.) Move in service rig and associated equipment.

2.) Remove blanket casing and leaching casing, if possible.

3.) Set bridge plug and cement production casing at least 100 above the top of the MacCrady or to surface. Set bridge plug and cement from 100 feet deep to surface.

4.) Remove wellhead. Cut and remove all casing 3 to 5 feet below ground surface. Weld cap and marker pipe onto casing. Extend marker pipe above ground surface and install well identification plate. Continue to survey well as subsidence monument while brine production occurs within the immediate vicinity.

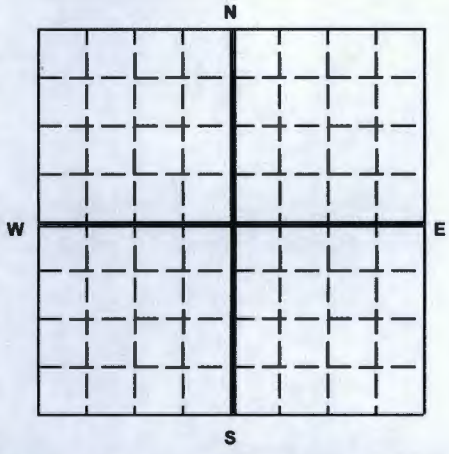
OMB No. 2040-0042 Approval Expires 12/31/2011

United States Environmental Protection Agency
Washington, DC 20460

PLUGGING AND ABANDONMENT PLAN

Name and Address of Facility	Name and Address of Owner/Operator
Texas Brine Company Saltville, LLC 864 Ader Lane, Saltville, VA 24370-4309	Texas Brine Company Saltville, LLC 4800 San Felipe, Houston, TX 77056-3908

Locate Well and Outline Unit on Section Plat - 640 Acres



State	County	Permit Number
Virginia	Smyth / Washington	

Surface Location Description

___ 1/4 of ___ 1/4 of ___ 1/4 of ___ 1/4 of Section ___ Township ___ Range ___

See Figure 1 – Topographic Map

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location ____ ft. from (N/S) ___ Line of quarter section and ____ ft. from (E/W) ____ Line of quarter section.

TYPE OF AUTHORIZATION

- ☐ Individual Permit
- ☑ Area Permit
- ☐ Rule

Number of Wells 10

Lease Name Saltville

WELL ACTIVITY

- ☐ CLASS I
- ☐ CLASS II
  - ☐ Brine Disposal
  - ☐ Enhanced Recovery
  - ☐ Hydrocarbon Storage
- ☑ CLASS III

Well Number

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE

METHOD OF EMPLACEMENT OF CEMENT PLUGS

- ☐ The Balance Method
- ☐ The Dump Bailer Method
- ☐ The Two-Plug Method
- ☐ Other

See Figure 10 – Typical Plugging Detail

CEMENTING TO PLUG AND ABANDON DATA:	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Size of Hole or Pipe in which Plug Will Be Placed (inche							
Depth to Bottom of Tubing or Drill Pipe (ft							
Sacks of Cement To Be Used (each plug)							
Slurry Volume To Be Pumped (cu. ft.)							
Calculated Top of Plug (ft.)							
Measured Top of Plug (if tagged ft.)							
Slurry Wt. (Lb./Gal.)							
Type Cement or Other Material (Class III)							

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)

From	To	From	To

Estimated Cost to Plug Wells

$50,000 Per Well

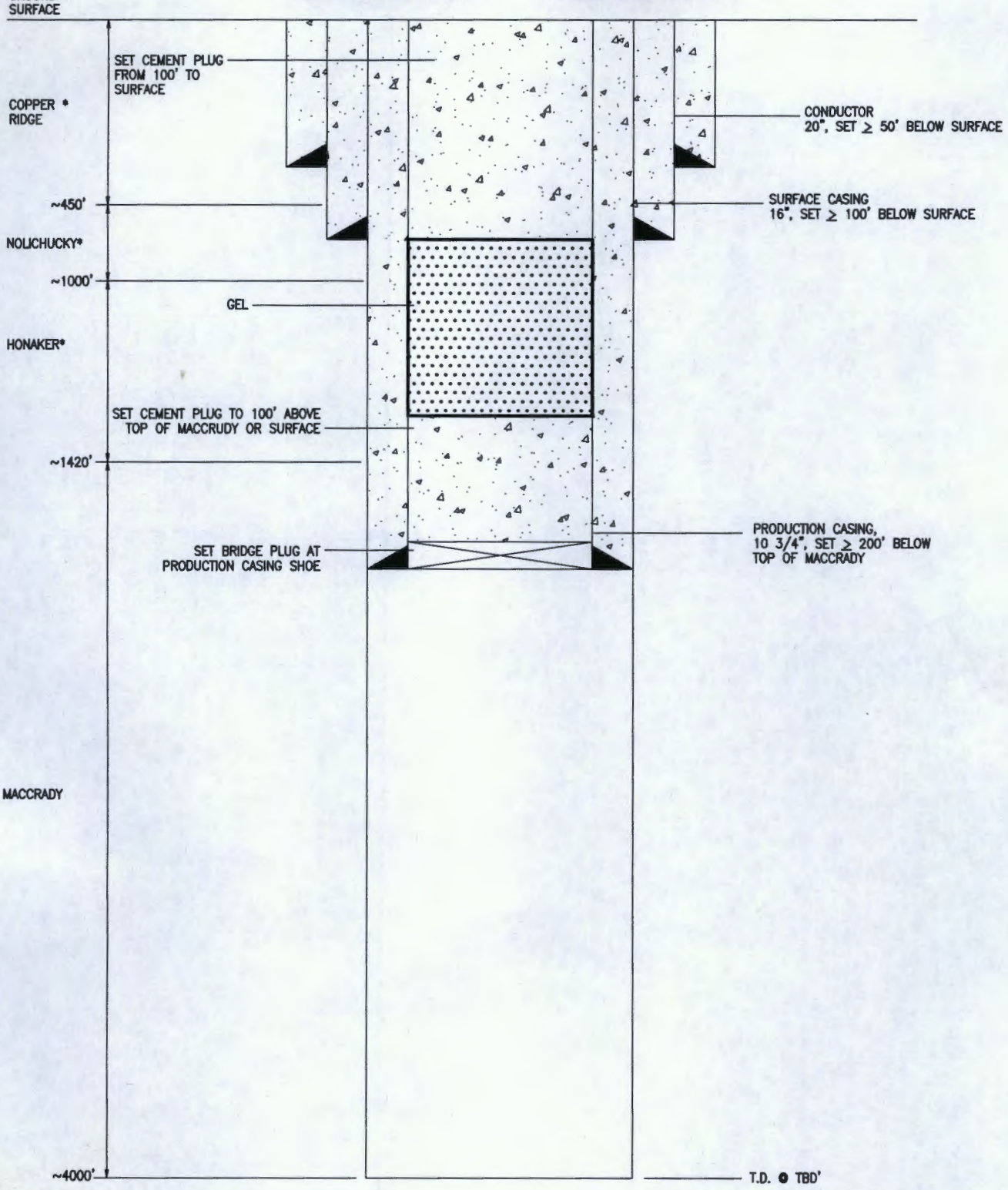
Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title *(Please type or print)*	Signature	Date Signed
Mark Cartwright, President		9/1/10

EPA Form 7520-14 (Rev. 12-08)

Figure 10 - Typical Plugging Detail



NOTES:
1. DEPTHS SHOWN ARE TYPICAL FOR WELLS SOUTHEAST OF SALTVILLE FAULT.
2. ALL DEPTHS AND SIZES ARE APPROXIMATE AND MAY BE REVISED PER FIELD CONDITIONS.
3. REMOVE, IF POSSIBLE, BLANKET AND LEACHING CASINGS FOR CEMENT PLUGGING.

* IF PRESENT

NO.	REVISION	DATE	APPR.
A	ISSUED FOR REVIEW	06/29/11	--
B	CHANGES	08/31/11	MC

ATTACHED IMAGES:

UNITEDBRINE SERVICES COMPANY

SCALE: NONE | APPROVED: TEXAS BRINE CO. | DRAWN BY: AD, Trevino
DATE: 06/29/11 | REVISED BY:

TBC–SALTVILLE
WELL SCHEMATIC

TYPICAL PUGGING DETAIL FOR BRINE WELL

TBC–SALTVILLE

FILENAME – DATE – TIME: TYP_PUGGING_DETAIL.DWG – 06/29/11–15:0 | DWG. NO. --

ATTACHMENT R – NECESSARY RESOURCES

According to the abandonment specifications, TBCS estimates that each wellbore will require $50,000 to plug and abandon. TBCS will obtain a bond for each well as it is drilled and a copy of the bond will be delivered to EPA after the well is drilled.

ATTACHMENT S – AQUIFER EXEMPTIONS

An Aquifer Exemption is not requested.

ATTACHMENT T – EXISTING EPA PERMITS

TBCS currently holds the following permits under authority of the Environmental Protection Agency or the Commonwealth of Virginia:

- **Permit ID Number VAS3G931BSMY** – An Underground Injection Control (UIC) area permit for seven (7) Class III G injection wells with a modification effective date of August 10, 2011, with an effective issuance date of February 24, 2004 which remains in effect for the operational life of the facility, and an effective transfer date of November 5, 2007 from Spectra Energy to Texas Brine Company Saltville, LLC. This permit currently includes Wells 1A, 9, 13A, 14A, 15, 17, and 131 but may be transferred to other wells upon appropriate abandonment of currently permitted wells.

- **Permit ID Number VA0090115** – A Virginia Pollutant Discharge Elimination System (VPDES) discharge permit for brine processing with an effective date of April 14, 2008 which remains in effect until April 13, 2013.

ATTACHMENT U – DESCRIPTION OF BUSINESS

Texas Brine Company Saltville, LLC (TBCS) was incorporated under the laws of the state of Texas on May 3, 2007 and was registered with the Commonwealth of Virginia – State Corporation Commission on May 18, 2007. On June 20, 2007, TBCS purchased the Saltville Brine Field for the purpose of producing and selling brine. TBCS is privately owned with the principal office at 4800 San Felipe, Houston, Texas 77056 and a local office onsite at 864 Ader Lane, Saltville, Virginia 24370. TBCS currently produces brine under EPA Permit ID Number VAS3G931BSMY with authorization to construct and operate seven (7) Class III G injection wells through injection into the MacCrady Formation. This brine production is categorized under the Standard Industrial Classification (SIC) Code 1479. TBCS proposes to expand the existing operations to include additional wells via this application.

TBCS sells brine onsite to United Salt Corporation (USC) through a partnership and mutual ownership. USC processes the brine and evaporates salt under SIC Code 2899. USC returns the non-evaporated fluid to TBCS for re-injection. USC sells crystalline salt in bags and in bulk to agricultural and commercial markets.

Appendix B
Geologic Data

DRILLING PROGNOSIS

Well Name:	EH - 131	County:	Smyth
Tract:	Soyers	District:	Town of Saltville
VA State File No.	SM - 0003	Elevation K. B.	2164.39'
VA State Permit No.	#2854	Elevation G. L.	2154.39'

Formation	Depth K.B.	Elevation	Thickness	Gas checks*
Copper Ridge Dolomite	0	2,164	450	
Nolichucky Dolomite	450	1,714	550	
Honaker Dolomite	1,000	1164	414	
Saltville Fault (Water Flows)	1,414	750	0	
MacCrady Formation	1,414	750	2550	X
Price Sands and Siltstones	3,964	-1,800	950	X
Berea Sandstone	4,914	-2,750	20	X
Devonian Shales	4,934	-2,780	3163	X
Onondaga (Huntersville Chert)	8,097	-5,933	70	X
Wildcat Valley (Oriskany Sandstone)	8,167	-6,003	20	X
Clinton Sands and Shales	8,187	-6,023	140	X
Clinch Sandstone	8,327	-6,163	280	X
Juniata (Sequatchie) Shale	8,607	-6,443	150	X
Estimated Total Depth	8,757	-6,593		X

Casing	O.H.	Depth	Open Hole Logs	Cased Hole Logs
28" Conductor	30"	20'		
22", 114.81#/ft., .500 XLF	26"	500'	GR/DEN/TEMP/DIL/NEU/CAL	CBL/GR/TEMP
16" O.D., 75#/ft. J-55	20"	1500'	GR/DEN/TEMP/DIL/NEU/CAL	CBL/GR/TEMP
11 3/4" O.D., 54#/ft. J-55	15"	2750'	GR/DEN/TEMP/DIL/NEU/CAL	CBL/GR/TEMP
8 5/8" O.D., 32#/ft. J-55	10 1/2"	4000'	GR/DEN/TEMP/DIL/NEU/CAL	CBL/GR/TEMP
4 1/2" 11.6#/ft. N-80	7 7/8"	8700'	GR/DEN/TEMP/DIL/NEU/CAL	CBL/GR/TEMP

Sample cuttings are to be collected every 10' from Surface to TD.
Use KCl and Clay Control in drilling foam from 1500' to 4000'
Rig up mudloggers after drilling out 11 3/4""

Directions to EH - 131 from Wythville, Virginia
Take I - 81 South from Wythville to Exit 35 at Chilhowie, VA
Get off I-81 at Exit 35, go to stop sign, turn right onto Rt. 107 North
Go to stoplight, go straight on Rt 107 North
Go 5.0 miles on Rt. 107, Turn LEFT onto Rt. 610 at yellow flashing light
Go 1.1 miles, Bear Right at "Y" just before 10 ton weight limit bridge
Go 0.6 miles to top of hill, bear left onto gravel road
Follow 1000' to top of hill, bear left through gate, 500' to site

Appendix C
Ponds A, B, and C Sample Analysis Data

Saltville VPDES Permit Monitoring

December, 2010

Monthly Brine Pond, Manhole and Leak Detection Pipes Monitoring Report

Person: Eddie Barker **Date:** 12/31/2010

Brine Holding Ponds A,B, & C

PARAMETER	pH	CONDUCTIVITY	TDS
UNITS	S.U.	umhos/cm2	mg/L
FREQUENCY	Dec. & June	Dec. & June	Dec. & June
SAMPLE TYPE	Grab	Grab	Grab
POND A (1077244)	5.2	2619	1238
POND B (1077245)	6.6	12540	6588
POND C (1077246)	8.8	294400	219658

Brine Holding Ponds A & B Leak Detection Monitoring Manholes
Brine Holding Pond C Leak Detection Pipes

PARAMETER	pH	CONDUCTIVITY	Static Level	Flow Rate	Collection Amount
UNITS	S.U.	umhos/cm2	inches	time in seconds or minutes & seconds	ml
FREQUENCY	monthly	monthly	weekly	weekly	weekly
SAMPLE TYPE	Grab	Grab	IS	IS	IS
MH-A1 (1077216)	ND	ND	ND	----------	----------
MH-A2 (1077217)	6.6	471	28	----------	----------
MH-A3 (1077218)	7.0	836	33	----------	----------
MH-A4 (1077219)	5.4	281200	43	----------	----------
MH-A5 (1077220)	5.0	350000	67	----------	----------
MH-A6 (1077221)	5.6	294600	66	----------	----------
MH-A7 (1077222)	ND	ND	ND	----------	----------
MH-A8 (1077223)	7.2	1149	28	----------	----------
MH-B1 (1077224)	7.5	1901	40	----------	----------
MH-B2 (1077225)	7.2	146	46	----------	----------
MH-B3 (1077231)	7.4	515	49	----------	----------
MH-B4 (1077227)	ND	ND	ND	----------	----------
MH-B5 (1077228)	ND	ND	ND	----------	----------
MH-B6 (1077229)	ND	ND	ND	----------	----------
MH-B7 (1077230)	7.5	790	48	----------	----------
MH-B8 (1077232)	8.0	674	41	----------	----------
DP-C1 (1077233)	ND	ND	----------	ND	150
DP-C2 (1077234)	ND	ND	----------	ND	150
DP-C3 (1077235)	ND	ND	----------	ND	150
DP-C4 (1077236)	ND	ND	----------	ND	150
DP-C5 (1077237)	ND	ND	----------	ND	150
DP-C6 (1077238)	ND	ND	----------	ND	150
DP-C7 (1077239)	ND	ND	----------	ND	150
DP-C8 (1077240)	ND	ND	----------	ND	150
DP-C9 (1077241)	ND	ND	----------	ND	150

Brine Holding Ponds A & C Cover Sump Discharges

PARAMETER	pH	CONDUCTIVITY	Chloride	Flow
UNITS	S.U.	umhos/cm2	mg/l	MGD
FREQUENCY	monthly	monthly	Dec., March, June, Sept	monthly
SAMPLE TYPE	Grab	Grab	Grab	estimate
Pond A (1077242)	5.3	81	20	----------
Pond C (1077243)	4.9	34	7	

Saltville VPDES Permit Monitoring

December, 2009

Monthly Brine Pond, Manhole and Leak Detection Pipes Monitoring Report

Person: J. Evans **Date:** 12/31/2009

Brine Holding Ponds A,B, & C

PARAMETER	pH	CONDUCTIVITY	TDS
UNITS	S.U.	umhos/cm2	mg/L
FREQUENCY	Dec. & June	Dec. & June	Dec. & June
SAMPLE TYPE	Grab	Grab	Grab
POND A (1007208)	6.0	13000	7338
POND B (1007209)	7.1	11000	6016
POND C (1007210)	9.7	388000	279540

Brine Holding Ponds A & B Leak Detection Monitoring Manholes
Brine Holding Pond C Leak Detection Pipes

PARAMETER	pH	CONDUCTIVITY	Static Level	Flow Rate	Collection Amount
UNITS	S.U.	umhos/cm2	inches	time in seconds or minutes & seconds	ml
FREQUENCY	monthly	monthly	weekly	weekly	weekly
SAMPLE TYPE	Grab	Grab	IS	IS	IS
MH-A1 (1007181)	ND	ND	ND	----------	----------
MH-A2 (1007182)	7.0	403	24	----------	----------
MH-A3 (1007183)	7.4	847	27	----------	----------
MH-A4 (1007184)	6.6	190	43	----------	----------
MH-A5 (1007185)	5.4	354000	67	----------	----------
MH-A6 (1007186)	6.0	306000	69	----------	----------
MH-A7 (1007187)	ND	ND	ND	----------	----------
MH-A8 (1007188)	7.6	1139	15	----------	----------
MH-B1 (1007189)	7.6	1819	41	----------	----------
MH-B2 (1007190)	7.7	485	45	----------	----------
MH-B3 (1007191)	7.5	512	45	----------	----------
MH-B4 (1007192)	ND	ND	ND	----------	----------
MH-B5 (1007193)	ND	ND	ND	----------	----------
MH-B6 (1007194)	ND	ND	ND	----------	----------
MH-B7 (1007195)	7.7	596	49	----------	----------
MH-B8 (1007196)	8.4	821	17	----------	----------
DP-C1 (1007197)	6.6	376000	----------	51	150
DP-C2 (1007198)	6.0	300000	----------	47	150
DP-C3 (1007199)	7.1	280000	----------	128	150
DP-C4 (1007200)	6.1	294000	----------	55	150
DP-C5 (1007201)	7.0	324000	----------	747	150
DP-C6 (1007202)	7.0	288000	----------	527	150
DP-C7 (1007203)	7.2	296000	----------	502	150
DP-C8 (1007204)	6.5	312000	----------	552	150
DP-C9 (1007205)	6.0	320000	----------	42	150

Brine Holding Ponds A & C Cover Sump Discharges

PARAMETER	pH	CONDUCTIVITY	Chloride	Flow
UNITS	S.U.	umhos/cm2	mg/l	MGD
FREQUENCY	monthly	monthly	Dec., March, June, Sept	monthly
SAMPLE TYPE	Grab	Grab	Grab	estimate
Pond A (1007206)	5.7	947	285	----------
Pond C (1007207)	6.2	3165	960	

Texas Brine Company Saltville, LLC
Figure 2 – Area of Review Map

NOTES:
1. THE TOPOGRAPHIC DATA IS DERIVED FROM AERIAL MAPPING PREPARED BY TUCK MAPPING SOLUTIONS, LLC. PERFORMED 11-18-00 AND 12-01-09.
2. ALL UTILITIES ARE APPROXIMATE. ALL POLITICAL BOUNDARIES ARE APPROXIMATE. THE LOW PRESSURE BRINE FIELD BOUNDARY AND SALTVILLE FAULT ARE APPROXIMATE.
3. THIS EXHIBIT WAS PREPARED ON 04-05-2011.

LEGEND

- UIC AREA PERMIT
- WELLS UNDER PERMIT ID #VAS3G931BSMY
- AREA OF REVIEW
- TBCS BOUNDARY
- SGSC BOUNDARY
- POLITICAL BOUNDARY
- INDEX CONTOUR
- INTERMEDIATE CONTOUR
- WATER
- PAVED ROAD
- UNPAVED ROAD
- BUILDING
- FENCE
- TREE
- UTILITY POLE
- SPOT ELEVATION
- OVERHEAD ELECTRIC
- ACTIVE WELL
- INACTIVE WELL

PREPARED BY
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